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CHANGES IN MEDICAL CONSUMERS' SAFETY AWARENESS OF MEDICAL SERVICE UTILIZATION CAUSED BY COVID-19

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ABSTRACT

Backgrounds: *Due to the global spread of COVID-19 in 2020, there was a significant decrease in medical service utilization, and the perception of medical consumers towards medical institutions has been influenced by changes in the social environment. Therefore, we investigated the changes in safety awareness of medical service utilization among healthcare consumers in response to the COVID-19 pandemic.*

Purpose: *The purpose of this study is to use the latest trends in safety awareness of medical utilization as a foundational data for patient safety education and safety activities among medical consumers at each medical institution.*

Methods: *This study used the data of Medical Service Experience Survey in Korea. To compare before and after the outbreak of COVID-19, we collected and analyzed data from 2019 and 2021. The data were obtained through stratified random sampling, and the analysis included 12,507 and 13,546 participants in 2019 and 2021 respectively. Results: First, for both outpatient and inpatient services, the percentage of subjects who felt anxious for infection after the onset of COVID-19 was higher than before, with outpatient services showing 7.456 times higher and inpatient services showing 4.409 times higher anxiety. Second, with regard to safety facilities such as emergency exits and fire extinguishers in medical institutions, compared to before the outbreak of COVID-19, the rate of safety facility confirmation after the outbreak was 1.143 times higher in outpatient services, while there was no statistically significant difference in inpatient services.*

Conclusions: *To alleviate the anxiety of medical consumers regarding infections and improve their safety awareness of medical service utilization, it is necessary to strengthen education and information provision for those who use outpatient services, enhance communication with medical providers, and expand promotion of safety awareness.*

Keywords: medical services, medical consumer, safety awareness, medical service utilization, COVID-19

1. INTRODUCTION

Medical services have shifted from a provider-centered approach in the past to a consumer-centered approach today. In 2001, the US IOM (Institute of Medicine) announced that the six core elements of healthcare quality were patient-centeredness, safety, effectiveness, timeliness, efficiency, and equity (Institute of Medicine, 2001). Since then, each hospital has continued to apply methods such as patient experience evaluation and patient satisfaction surveys to provide patient-centered medical services and improve the environment. Patient-centered medical service has become increasingly important globally, and awareness of this has been strengthened. Additionally, the OECD (Organization for Economic Cooperation and Development) collects patient experience data in six areas from the perspective of healthcare quality, including the field of patient safety (Shin et al., 2020).

In Korea, the Patient Safety Act was established on January 29, 2015, and as the law was enforced in July 2016 (Korean Law Information Center, Patient Safety Act, 2016), social interest and awareness of patient safety have spread. The Patient Safety Act mandates that the head of a healthcare institution and healthcare professionals must equip the facility, equipment, and personnel to prevent patient safety accidents and fulfill necessary obligations to prevent such accidents (Korean Law Information Center, Patient Safety Act: Article 4, 2016). And the WHO (World Health Organization) defined patient safety as “A framework of organized activities that creates cultures, processes, procedures, behaviours, technologies and environments in health care that consistently and sustainably lower risks, reduce the occurrence of avoidable harm, make errors less likely and reduce the impact of harm when it does occur (World Health Organization, 2021). As social awareness of patient safety spreads, healthcare providers are discussing education for each medical institution, internal investigations for each hospital, and the establishment of institutional mechanisms. Medical colleges are implementing case-based learning for patient safety education (Go, 2022), while medical institutions are establishing dedicated departments and personnel for patient safety and conducting internal and external education (Shin et al., 2015). In other words, healthcare providers are making efforts to enhance patient safety according to the system of each medical institutions.

The Korean government is also making efforts to create a safe medical environment by conducting various evaluations and surveys. The Patient Experience Survey conducted by the Health Insurance Review & Assessment service (HIRA) every two years since 2017 includes an investigation of 'clean environment' and 'safe environment' (Lee & Lee, 2022). Also, the Medical Service Experience Survey conducted annually by the Korea Institute for Health and Social Affairs investigates the subjects' anxiety about infections and whether the medical facility has adequate safety facilities (Shin et al., 2021). In other words, the government surveys on medical institution environments targeting medical consumers include inquiries about safety measures. The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey in the United States investigates the level of cleanliness, noise levels, safety, and comfort in the hospital environment (Hospital Consumer Assessment of Healthcare Providers and Systems, 2022). In the UK, the inpatient services surveys also include questions related to the hospital environment, such as sleep disturbance and the level of cleanliness (Care Quality Commission & NHS, 2022). In the 2016 OECD Health Care Quality Indicators (HCQI) Expert Meeting, it was suggested that patient safety indicators should be developed to improve the quality of healthcare, proposing indicators for prevention, events, and event management

measurement (Shin et al., 2019).

To create a safe medical institution environment, not only the efforts of medical providers but also the awareness and interest of medical consumers are necessary. According to the study by Kim & Park, patient safety education conducted on hospitalized patients improved their awareness and performance of patient safety activities (Kim & Park, 2021). In addition, in Switzerland, patients who perceive a high risk of medical errors actively engage in preventive protective behaviors such as notifying healthcare professionals of potential errors or requesting hand hygiene compliance (Longtin, 2009). In other words, providing patient safety education to patients visiting hospitals is important, and raising awareness of patient safety among medical consumers can be an effort to make the entire medical environment safer, not just for the patients themselves. To improve patient safety, a comprehensive and systematic approach is needed, along with the cooperation of stakeholders involved in the healthcare delivery process such as the government, medical institutions, healthcare professionals, and patients (Kim & Park, 2021; Lee, 2020; Pyo et al., 2018).

While various efforts of research and evaluation have contributed to changing awareness of patient safety, it is also worth considering changes in awareness of medical use safety due to the global impact of COVID-19, which has caused infectious diseases worldwide. In fact, patient medical usage significantly decreased in 2020 due to the global spread of COVID-19. In Korea, there was a 14.5% decrease in medical usage in 2020 compared to the previous year, while in the United States, outpatient visits between March and June 2020 decreased by 40% compared to the previous year, and in the UK, outpatient visits between March and October 2020 decreased by 27% compared to the previous year (Park et al., 2021; Park & Choi, 2022; Morris et al., 2021; Mehrotra et al., 2020). There are various reasons for the natural decrease in medical service utilization, and it is predicted that changes in medical consumers' perception of medical institutions according to social environmental changes have also contributed to this phenomenon. In other words, it is necessary to examine changes in safety awareness regarding medical service utilization due to the pandemic phenomenon of COVID-19, rather than artificial efforts by medical providers. And through this study, the latest trends in safety awareness regarding medical service utilization are identified, which are used as foundational data for patient safety education and activities among medical consumers at each medical institution.

The purpose of this study is to identify the changes in medical consumers' safety awareness regarding medical service utilization due to COVID-19. The specific objectives are as follows:

First, we compare and analyze the difference in anxiety about infection and the confirmation of safety facilities in medical institutions before and after the outbreak of COVID-19 among medical consumers.

Second, we investigate the impact of the outbreak of COVID-19 on the anxiety of medical consumers regarding infection in the medical services.

Third, we investigate the impact of the outbreak of COVID-19 on the confirmation of safety facilities by medical consumers while using medical institutions.

2. MATERIALS AND METHODS

2.1. Study population and data collection

2.1.1. Data collection

This study is a descriptive analytical study using data from the "Medical Service Experience Survey," which is conducted annually in Korea, to identify changes in medical consumers' safety awareness of medical service utilization. The Medical Service Experience Survey has been conducted by the Ministry of Health and Welfare and the Korea Institute for Health and Social Affairs every year since 2017, targeting all household members aged 15 and over (Shin et al., 2021). The survey principle is based on the participation of the respondents themselves, and in cases where the target individual is elderly or in poor health and unable to respond on their own, allowing a knowledgeable caregiver to respond on their behalf regarding their experience with medical services (Shin et al., 2019).

The raw data for the study subjects and data collection were downloaded from the Statistics Korea MDIS (Microdata Integrated Service) website (https://mdis.kostat.go.kr/index.do). The data collected to compared before and after the outbreak of COVID-19 consisted of survey data from 2019 prior to the outbreak of COVID-19 (Medical service period: July 1, 2018, to June 30, 2019) and survey data from 2021 after the outbreak of COVID-19 (Medical service period: July 1, 2020, to June 30, 2021). Using the survey households from the Population and Housing Census as a basis, a stratified sampling method was applied, and a total of 6,000 households were selected as samples nationwide. In 2019, a total of 12,507 people (Survey period: July 8, 2019, to September 20, 2019) were surveyed, and in 2021, a total of 13,546 people (Survey period: July 19, 2021, to September 17, 2021) were surveyed (Shin et al., 2021; Shin et al., 2019).

2.1.2. Extraction of data for subject selection

The data extraction design for people selection in this study is shown in Figure 1. People who had no experience using medical services in the past year were excluded from the survey, resulting in the exclusion of 3,646 subjects in the 2019 survey and 5,659 subjects in the 2021 survey from this study. Therefore, the total number of subjects included in this study from the 2019 survey, which was before the onset of COVID-19, was 8,861 people, including 8,721 outpatient services and 543 inpatient services. In the 2021 survey, after the onset of COVID-19, a total of 7,887 people were included in this study, including 7,782 outpatient services and 217 inpatient services. In total, 16,648 people were included in this study, including those who used both outpatient and inpatient services.

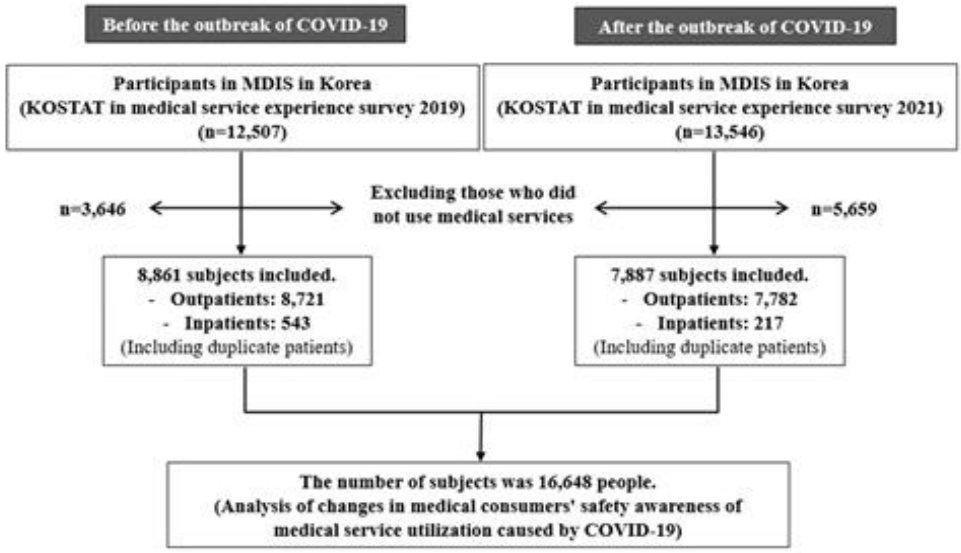

Fig. 1: Data extraction for selection of study subjects

2.2. Measures of variables

2.2.1. Independent variables

The independent variable of this study is the utilization of medical service according to the presence or absence of COVID-19. Prior to the occurrence of COVID-19, it refers to the use of medical service between July 1, 2018 and June 30, 2019, while after the occurrence of COVID-19, it refers to the use of medical service between July 1, 2020 and June 30, 2021. Therefore, the independent variable was coded as 'COVID-19=0' for before the occurrence of COVID-19 and 'COVID-19=1' for after the occurrence of COVID-19. This categorizes the groups as 'experimental group' which refers to those who used medical service after the occurrence of COVID-19, and 'control group' which refers to those who used medical service before the occurrence of COVID-19.

2.2.2. Dependent variables

The dependent variables of this study are the presence of anxiety for infection and the presence of confirmation of safety facilities. In regards to the presence of anxiety for infection, we analyzed the question "Have you ever felt anxious about infection while using medical services?" by coding 'Yes=1' and 'No or Unknown=0' for analysis. In regards to the presence of confirmation of safety facilities, we analyzed the question "Have you checked safety facilities such as emergency exits and fire extinguishers while using medical services?" by coding 'Yes=1' and 'No=0' for analysis.

2.2.3. Control variables

In this study, the control variables are patient-related factors. The control variables were analyzed by categorizing them into a total of seven variables as shown in Table 1. In this study, the control variables are patient-related factors. Patient's demographic factors included sex, age, education level, type of medical insurance, household income level, living area and presence of chronic disease.

Table 1: Control variables (Patient-related factors)

Control variables	Coding & meaning

Sex	Men=1, Women=2
Age	5~29=1, 30~39=2, 40~49=3, 50~59=4, over 60=5
Education level	Below primary education=1, Secondary education=2, Higher education=3
Medical insurance	National Health Insurance=1, Medical aid program=2
Household income level	Q1~Q5
Living area	Urban=1, Rural=2
Chronic diseases	Experience of receiving treatment for chronic diseases No=0, Yes=1

2.3. Statistical analysis

The collected data was analyzed using IBM SPSS 25.0 version program. First, to compare the general characteristics of subjects before and after the occurrence of COVID-19, chi-square tests were conducted. Second, chi-square tests were conducted to compare and analyze the differences in anxiety for infection and confirmation of safety facilities in medical services. Third, logistic regression analysis was conducted to determine the effect of the occurrence of COVID-19 on the occurrence of anxiety for infection in medical services. Fourth, logistic regression analysis was conducted to determine the effect of the occurrence of COVID-19 on the confirmation of safety facilities such as emergency exits and fire extinguishers while using medical services.

3. RESULTS

3.1. Comparison of General Characteristics of Subjects Before and After Covid-19 Outbreak

The general characteristics difference between the subjects surveyed prior to the onset of COVID-19 (2019 Medical Service Experience Survey) and those surveyed after the onset of COVID-19 (2021 Medical Service Experience Survey) are shown in Table 2. Comparing before and after COVID-19 outbreak, the number of medical service users decreased by about 1,000, from 8,861 in the 2019 survey to 7,887 in the 2021 survey.

Regarding the subjects who used outpatient services, there were significant differences in age ($p<0.001$), education level ($p<0.001$), type of medical insurance ($p=0.032$), household income level ($p<0.001$), and presence of chronic diseases ($p<0.013$) between the two groups. However, there was no difference in sex and living area. Regarding the subjects who used inpatient services, there were significant differences in age ($p=0.043$) and education level ($p=0.018$) between the two groups. However, there was no difference in sex, type of medical insurance, household income level, living area, and presence of chronic diseases. In other words, the subjects who used outpatient services showed greater differences in the general characteristics of medical service utilization compared to those who used inpatient services.

Table 2: Comparison of general characteristics of subjects before and after COVID-19 outbreak

Variables	Outpatients (n, %)				Inpatients (n, %)			
	Before COVID-19	After COVID-19	x^2	p value	Before COVID-19	After COVID-19	x^2	p value

		(n=8,721)	**(n=7,782)**			**(n=543)**	**(n=217)**		
Sex	Men	3,816(43.8)	3,478(44.7)	1.462	0.227	233(42.9)	88(40.6)	0.353	0.552
	Women	4,905(56.2)	4,304(55.3)			310(57.1)	129(59.4)		
Age	15~29	836(9.6)	763(9.8)	36.575	<0.001	26(4.8)	22(10.1)	9.870	0.043
	30~39	892(10.2)	737(9.5)			37(6.8)	17(7.8)		
	40~49	1,251(14.3)	948(12.2)			59(10.9)	15(6.9)		
	50~59	1,928(22.1)	1,979(25.4)			99(18.2)	39(18.0)		
	over 60	3,814(43.7)	3,355(43.1)			322(59.3)	124(57.1)		
Education level	Below primary education	1,620(18.6)	615(7.9)	407.297	<0.001	153(28.2)	42(19.4)	8.081	0.018
	Secondary education	4,457(51.1)	4,653(59.8)			288(53.0)	120(55.3)		
	Higher education	2,644(30.3)	2,514(32.3)			102(18.8)	55(25.3)		
Medical insurance	National Health Insurance	8,454(96.9)	7,497(96.3)	4.590	0.032	505(93.0)	202(93.1)	0.002	0.967
	Medical aid program	267(3.1)	285(3.7)			38(7.0)	15(6.9)		
Household income level	1Q	1,733(19.9)	1,897(24.4)	101.358	<0.001	175(32.2)	88(40.6)	7.189	0.126
	2Q	2,103(24.1)	1,557(20.0)			130(23.9)	38(17.5)		
	3Q	1,321(15.1)	1,397(18.0)			63(11.6)	24(11.1)		
	4Q	1,830(21.0)	1,456(18.7)			94(17.3)	31(14.3)		

	5Q	1,734(19.9)	1,475(19.0)			81(14.9)	36(16.6)		
Living area	Urban	6,357(72.9)	5,568(71.5)	3.702	0.054	374(68.9)	140(64.5)	1.347	0.246
	Rural	2,364(27.1)	2,214(28.5)			169(31.1)	77(35.5)		
Chronic diseases	No	4,818(55.2)	4,448(57.2)	6.103	0.013	214(39.4)	91(41.9)	0.411	0.524
	Yes	3,903(44.8)	3,334(42.8)			329(60.6)	(126)58.1		

3.2. Anxiety for infection in medical services and confirmation of safety facilities in medical institutions (comparison before and after COVID-19 outbreak)

A comparative analysis was conducted on ‘anxiety for infection during the use of medical services' and 'the confirmation of safety facilities in medical institutions' during the use of medical services before and after the outbreak of COVID-19. The result of comparison is shown in Table 3

In terms of 'anxiety for infection', for outpatient services, the percentage of respondents who reported feeling anxious about infection was 6.0% before the outbreak of COVID-19, but after the outbreak it increased to 32.8%, showing a statistically significant difference ($p<0.001$). Similarly, for inpatient services, the percentage was 9.6% before the outbreak of COVID-19, but after the outbreak it increased to 30.0%, showing a statistically significant difference ($p<0.001$)

Regarding ‘confirmation of safety facilities in medical institutions’, for outpatient services, 23.8% responded that they confirmed the safety facilities themselves before the outbreak of COVID-19, but after the outbreak it increased to 26.2%, showing a statistically significant difference ($p<0.001$). In the case of inpatient services, although the rate of safety facility confirmation increased from 28.5% before the outbreak of COVID-19 to 35.5% after the outbreak of COVID-19, there was no statistically significant difference.

Table 3: Control Anxiety for infection in medical services and confirmation of safety facilities in medical institutions (comparison before and after COVID-19 outbreak)

Variables		**Outpatients**				**Inpatients**			
		Before COVID-19 (n=8,721)	**After COVID-19 (n=7,782)**	x^2	**p value**	**Before COVID-19 (n=543)**	**After COVID-19 (n=217)**	x^2	**p value**
Anxiety for infection	No or Unknown	8,198(94.0)	5,227(67.2)	1951.847	<0.001	491(90.4)	152(70.0)	49.429	<0.001
	Yes	523(6.0)	2,555(32.8)			52(9.6)	65(30.0)		
Confirmation of safety	No	6,648(76.2)	5,746(73.8)	12.591	<0.001	388(71.5)	140(64.5)	3.520	0.061
	Yes	2,073(23.	2,036(26.			155(28.	77(35.5		

facilities		8)	2)			5)	)		

3.3. Anxiety for infection in medical services

To investigate the impact of the outbreak of COVID-19 on the development of anxiety for infection in medical services, logistic regression analysis was conducted. The dependent variable was the presence or absence of anxiety for infection, and the control variables were patient-related factors, such as sex, age, education level, type of medical insurance, household income level, living area, and the presence of chronic diseases. The independent variable was the presence or absence of COVID-19.

The analysis of outpatient services showed that the level of anxiety for infection during medical services was 7.456 times higher (95% CI: 6.731-8.260) after the onset of COVID-19 compared to before. In addition, lower household income levels were associated with less anxiety for infection, and patients living in rural areas were less anxious for infection than those living in urban areas.

The analysis of inpatient services showed that the level of anxiety for infection during medical services was 4.409 times higher (95% CI: 2.868-6.779) after the onset of COVID-19 compared to before. There was no statistically significant difference in the level of anxiety for infection based on the patient-related factors.

Variables			Outpatients					Inpatients	
			B	SE	OR	95%CI	p Value	B	SE
(Constant)			-2.820	0.063	0.060	-	<0.001	-2.294	0.2
General characteristics (Control variables)	Sex	Men			1.000				
		Women	-0.025	0.044	0.975	0.894-1.063	0.562	0.094	0.2
	Age	15~29	-0.003		1.000	0.874-1.138		-0.212	0.3
		30~39		0.068	0.997		0.968		
		40~49	-0.190	0.062	0.827	0.732-0.934	0.002	-0.404	0.3
		50~59	-0.106	0.059	0.899	0.801-1.010	0.074		0.3
		over 60		0.059	0.963		0.514	-0.202	0.3
			-0.038			0.858-1.080		0.045	
	Education	Below primary education			1.000				
		Secondary education	0.279	0.074	1.322	1.143-1.529	<0.001	-0.310	0.3
		Higher education	-0.197	0.043	0.821	0.755-0.893	<0.001	0.019	0.1
	Medical insurance	National Health Insurance			1.000				
		Medical aid program	-0.037	0.126	0.963	0.753-1.233	0.766	0.158	0.3
	Household income level	1Q			1.000				
		2Q	-0.543	0.057	0.581	0.520-0.649	<0.001	-0.648	0.2
		3Q	-0.324	0.051	0.724	0.654-0.800	<0.001	-0.486	0.2
		4Q	0.114	0.048	1.121	1.020-1.233	0.018	-0.259	0.2
		5Q	0.072	0.048	1.075	0.978-1.181	0.136	0.206	
	Living area	Urban			1.000				
		Rural	-0.119	0.049	0.888	0.806-0.978	0.016	-0.300	0.2
	Chronic diseases	No			1.000				
		Yes	0.072	0.053	1.075	0.969-1.191	0.171	0.228	0.2
COVID-19 (Independent variable)		Before COVID-19			1.000				
		After COVID-19	2.009	0.052	7.456	6.731-	<0.0	1.484	0.2

Table 4: Logistic regression analysis of anxiety for infection

Table 5: Logistic regression analysis of confirmation of safety facilities

riables			Outpatients					Inpatients				
			B	SE	OR	95%CI	p value	B	SE	OR	95%CI	p value
onstant)			-1.182	0.044	0.307	-	<0.001	-0.859	0.189	0.424	-	<0.001
	Sex	Men Women	-0.035	0.037	1.000 0.966	0.898-1.039	0.350	-0.033	0.167	1.000 0.968	0.698-1.342	0.844
	Age	15~29 30~39 40~49 50~59 over 60	-0.124 -0.072 -0.051 0.049	0.056 0.051 0.049 0.048	1.000 0.883 0.931 0.950 1.050	0.791-0.985 0.842-1.028 0.864-1.045 0.956-1.156	0.026 0.156 0.294 0.310	0.080 0.048 -0.393 0.220	0.275 0.256 0.257 0.252	1.000 1.083 1.050 0.675 1.246	0.631-1.858 0.635-1.735 0.408-1.117 0.760-2.041	0.772 0.850 0.126 0.383
neral aracteristics ontrol iables)	Education	Below primary education Secondary education Higher education	0.052 -0.030	0.058 0.034	1.000 1.053 0.970	0.941-1.179 0.908-1.036	1.053 0.970	0.196 0.037	0.239 0.138	1.000 1.216 1.038	0.761-1.942 0.792-1.360	0.413 0.789
	Medical insurance	National Health Insurance Medical	-0.024	0.112	1.000 0.977	0.785-1.216	0.833	0.122	0.347	1.000 1.130	0.572-2.231	0.726

3.4. Confirmation of safety facilities in medical institutions

To investigate the impact of the outbreak of COVID-19 on the presence of safety facilities such as emergency exits and fire extinguishers during medical institutions, logistic regression analysis was conducted. The dependent variable was the presence or absence of safety facility confirmation, and the control variables were patient-related factors, such as sex, age, education level, type of medical insurance, household income level, living area, and the presence of chronic diseases. The independent variable was the presence or absence of COVID-19.

The analysis of outpatient services showed that the confirmation of safety facilities in medical institutions was 1.143 times higher (95% CI: 1.063-1.229) after the onset of COVID-19 compared to before, and the subjects with chronic diseases were 1.092 times (95% CI: 1.001-1.192) higher than subjects without chronic diseases.

The analysis of inpatient services showed a higher incidence of the confirmation of safety facilities in medical institutions after the onset of COVID-19 compared to before, but there was no statistically significant difference (95% CI: 0.997-2.003). Furthermore, there was no statistically significant difference in confirmation of safety facilities according to the patient-related factors.

4. DISCUSSION

This study aimed to investigate the changes in medical consumers' safety awareness of medical service utilization caused by COVID-19, and the results are discussed as follows.

In this study, the analyzed subjects were those who used medical institutions for medical treatment purposes such as diagnosis and therapy, so the higher the age, the higher the utilization rate of medical institutions. Therefore, in this study, the proportion of survey participants increased with age, and more than half of them were in the group aged 60 years and over.

The level of anxiety for infection increased significantly after the outbreak of COVID-19, with 32.8% of outpatients reporting anxiety for infection, compared to 6.0% before the outbreak, an increase of 26.8 percentage points. For inpatients, the percentage reporting anxiety for infection was 30.0% after the outbreak of COVID-19, compared to 9.6% before the outbreak, an increase of 24 percentage points. And when the control variables were introduced, the level of anxiety for infection was found to be 7.456 times higher for outpatient services and 4.409 times higher for inpatient services after the onset of COVID-19, compared to before the onset of COVID-19. In both cases, the proportion of people who experienced anxiety for infection after the onset of COVID-19 was higher than before the onset of COVID-19, and among them, the proportion of those who used outpatient services showed a significantly higher increase. Furthermore, for outpatient services, people with lower household income levels and those living in rural areas were less sensitive to infection and this result is similar to the findings of Kim's (2022) study. The reason for such a difference is that outpatient services showed relatively lower communication with medical providers, such as diagnosis, treatment, nursing, and health information, which resulted in less sensitivity to infection compared to inpatient services.

Park (2021) reported that the higher the anxiety for COVID-19 infection, the more likely people are to seek out health information. This phenomenon is attributed to the attempt to alleviate negative emotions such as anxiety for infection by accessing health information as quickly as possible (Park et al., 2021). Therefore, medical providers suggest the need for

enhanced communication and information provision to alleviate the anxiety of medical consumers using medical institutions regarding infection. Currently, in Korea, the medical institution accreditation system based on the Medical Service Act has been introduced as a measure to enhance the awareness of patient safety culture, which has gradually improved the awareness of medical staff on patient safety (23. Korean Law Information Center. Medical Service Act: Article 58, 2017; Jung & Rhu, 2017). However, infectious diseases such as COVID-19 that have caused significant social changes worldwide have also led to changes in the perception of medical consumers who seek to use medical institutions. In other words, there is a need for a shift from a provider-centered awareness of patient safety to a consumer-centered, which requires strengthening communication through education and information provision.

Regarding the confirmation of safety facilities such as emergency exits and fire extinguishers in medical institutions, in the case of outpatient services, 23.8% responded that they confirmed them before the outbreak of COVID-19, while 26.2% confirmed them themselves after the outbreak. In the case of inpatient services, 28.5% responded that they confirmed them before the outbreak of COVID-19, while 35.5% confirmed them themselves after the outbreak. And when the control variables were introduced, the confirmation of safety facilities was found to be 1.143 times higher for outpatient services compared to before the outbreak. In the case of outpatient services, the subjects with chronic diseases were more sensitive to confirming safety facilities. Although the confirmation rate of safety facilities increased after the outbreak of COVID-19 in both cases (outpatient and inpatient services), there was no statistically significant difference for inpatient services. Most medical institutions in Korea conduct basic education on patient safety (such as fall prevention and facility confirmation) during the hospitalization orientation on the first day of admission, which includes education on the location of safety facilities. Therefore, it can be inferred that the target population has some degree of awareness of safety facilities. However, in the case of outpatient services, since the length of stay in the medical institutions is short, hospitalization orientation and patient safety education are not conducted properly, so the subjects who had no prior awareness have shown an increase in their willingness and behavior to confirmation of safety facilities after the outbreak of COVID-19, and this showed a statistically significant difference. Overall, it was found that the awareness of safety regarding medical institutions facilities has increased after the outbreak of COVID-19 compared to before the outbreak.

In the past, research and activities on patient safety focused on preventing errors that could occur in the process of providing medical services, with a focus on medical providers, but recently, patient safety activities, including targeting patients themselves, are being actively carried out (Davis et al., 2011; Slawomirski et al., 2018; Shin, 2020). In other words, there is an increasing awareness that hospitalized patients can manage their own safety and be guaranteed patient safety (Weingart et al., 2011). That's why patients who use inpatient services have a higher awareness of safety compared to those who use outpatient services.

Patient safety education is mainly provided to hospitalized patients who require long-term treatment, so it is believed that patients who receive outpatient services and lack such education show more prominent behaviors such as anxiety for infection and checking safety facilities. Patients who require long-term hospitalization have a considerable amount of time in the hospital, so education on patient safety can be provided along with

communication and explanation by the medical providers during their hospital stay. However, for outpatient services, it is difficult to provide all such education and services. In other words, this study has demonstrated the importance of patient safety education in medical institutions, and it is also recognized that patient safety education is needed in outpatient services based on the findings. In terms of approaching patient safety awareness, medical providers tend to focus on the outcome of the patient, while medical consumers tend to focus on the process of treatment and communication with medical staff safety (Weingart et al., 2007). Therefore, to improve the patient safety awareness of medical consumers, it is necessary to strengthen education and information provision for patients using outpatient services, enhance communication with medical providers, and expand promotion of safety awareness.

In Kim's (2019) study, it was reported that patients lack interest in patient safety and are not actively engaged even when educational materials are provided (Kim et al., 2019). However, through this study, it has been confirmed that the awareness of medical consumers about safety has changed amidst the global spread of COVID-19. In other words, it has been confirmed through this study that there has been a change in the awareness of safety among medical consumers, with a greater interest in safety and a willingness to actively confirm safety compared to before the COVID-19 pandemic.

This study has some limitations. First, as a study using raw data, it could not reflect more diverse external variables due to the limited variable setting. Second, although stratified random sampling was conducted by region, the characteristics of each region's medical institutions were not reflected in the analysis of the dependent variables by region. Therefore, while interpretation of the overall trend and tendency is possible, it is important to be cautious when interpreting based on regional characteristics. Third, although the results were produced by comparing the data from 2019 and 2021 while controlling for the general characteristics of the subjects, the heterogeneity of the two groups could not be eliminated. Despite these limitations, this study has applied probability proportional stratified sampling and identified changes in medical consumers' safety awareness of medical service utilization, thus having representativeness that can be generalized. Therefore, this study has significance as a basic data for setting medical institution policy directions to grasp the latest trends and enhance the safety awareness of medical consumers. In the future, large-scale comprehensive studies will be needed that incorporate propensity score matching methods to remove heterogeneity among study subjects and consider various external variables of the subjects (comorbidities, severity of diseases, etc.), as well as regional characteristics.

5. CONCLUSION

The study utilized raw data from the Medical Service Experience Survey (2019, 2021) conducted through a sample survey to identify changes in medical consumers' safety awareness of medical service utilization.

As a result of this study, first, for both outpatient and inpatient services, the percentage of subjects who felt anxious for infection after the onset of COVID-19 was higher than before, with outpatient services showing 7.456 times higher and inpatient services showing 4.409 times higher anxiety. This is considered as a result of the relatively lower level of communication between medical providers and patients in outpatient services compared to inpatient services, and it is necessary to enhance communication and information sharing in order to alleviate patients' anxiety for infection. Second, with regard to safety facilities

such as emergency exits and fire extinguishers in medical institutions, compared to before the outbreak of COVID-19, the rate of safety facility confirmation after the outbreak was 1.143 times higher in outpatient services, while there was no statistically significant difference in inpatient services. The reason for this is that inpatients receive patient safety education when they are admitted, so it is assumed that the subjects have a certain level of awareness of safety facilities. On the other hand, in the case of outpatient services, the time spent in the medical institutions is short, making it difficult to perform patient safety education, resulting in a significant difference. In other words, after the outbreak of COVID-19, there was an increase in the behavior and willingness of subjects who previously had no awareness of safety facilities to confirmation them. Therefore, in order to enhance medical consumers' safety awareness of medical service utilization, it is necessary to strengthen education and information provision for subjects using outpatient services, enhance communication with medical providers, and expand promotion of safety awareness.

This study has significant implications for each medical institution as it provides current trends in medical consumers' safety awareness of medical service utilization and serves as foundational data for patient safety education and safety activities.

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